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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
TRUONG, DENNIS	

ART UNIT	PAPER NUMBER
2169	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/757,399	HALLMARK ET AL.	
	Examiner	Art Unit	
	DENNIS TRUONG	2169	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 April 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *27-52,63-88 and 92-95* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *29, 30-32, 33-34, 35-36, 37, 49-52, 65, 66-68, 69-70, 71-72, 73, 85-88* is/are allowed.

6)☒ Claim(s) *27,28,38,42,63,64,74 and 78* is/are rejected.

7)☒ Claim(s) *39-41,43-48,75-77,79-84 and 92-95* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 November 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 04/23/2009 has been entered.

Response to Amendments

2. It is acknowledged that claims 27, 29, 30, 33, 35, 37, 38, 42, 49, 63, 65, 6, 69, 71, 73, 74, 78 and 85 are amended.

3. Claims 27-52, 63-88 and 92-95 are pending.

Response to Arguments

4. Applicant's arguments in regards to claim 27 have been fully considered and are persuasive in that “task stealing" disclose by Hongjun (sec. 2.3) does not disclose "picking a second previously unassigned work partition based on part to size". However in (sec 2.2) Hongjun discloses the second phase which involves dynamic task acquisition and execution, and specifically discloses "processors acquire tasks from the system task pool….whenever a processor finishes the processing of the acquired task, it checks whether there are more tasks in the system. If there are tasks available in the system, the processor will be assigned the next task for execution." In this section Hongjun clearly discloses that picking a second previously unassigned task as the processor will be assigned the next task for execution where the tasks are from the system task pool. It should be understood that “the next task” means that the previous selected task is completed and a second task is being chosen for processing and since the tasks

are being chosen from the system task pool, these task has not been previously assigned to a particular processor.

5. As for Applicant's argument that Hongjun does not disclose that the task are being selected based on part to size. In Sec. 3.1, Hongjun discloses the process of generating tasks and discloses that the number of buckets determines the number of tasks which is represented by B, and the task table is generated from initial set of tables which represents the tasks and corresponding size of buckets. It is further disclosed that size of buckets are generated with large size of buckets first then the small buckets are merged into larger ones. Since the task table is generated from the initial set of tables and the larger buckets are first generated this shows that the resulting task table will represent a queue of task where the larger size of buckets are first. Therefore in section 2.2 and 3.2 where the processors are acquiring task the processors will be selecting the task with the larger size of buckets which meets the limitation as claimed.

6. Applicant's argument to claims 38 and 42 are fully considered and are persuasive. However are rejected under new grounds of rejection.

Allowable Subject Matter

7. Claims 30-32, 33-34, 35-36, 37, 49-52, 65, 66-68, 69-70, 71-72, 73, 85-88 are allowed.

8. Claims 39-41, 43-48, 75-77, 79-84, 92-93, 94-95 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 27-28, 63-64 are rejected under 35 U.S.C. 102(b) as being anticipated by **Hongjun Lu and Kian-Lee Tan ("Dynamic and Load-balanced Task-Oriented Database Query Processing in Parallel Systems")** (herein referenced as **Hongjun**).

As per claim 27, Hongjun discloses:

- **dividing the operation into a set of work partitions**, as (sec. 2.1) where a query is decomposed into an optimal amount of tasks, where the query is the operation and the tasks are work partitions.
- **assigning work partitions from said set of work partitions to a plurality of entities, wherein at least one entity of said plurality of entities is assigned a plurality of work partitions from said set of work partitions**, as (sec. 2.2, 3.2) where processors which are claimed plurality of entities acquire tasks from system task pool where the task pool is the claimed set of work partitions.
- **wherein the step of assigning work partitions is performed by assigning the work partitions in a sequence based at least in part on sizes associated with the work partitions**, as in Sec. 3.1, Hongjun discloses the process of generating tasks and discloses that the number of buckets determines the number of tasks which is represented by B, and the task table is generated from initial set of tables which represents the tasks and corresponding size of buckets. It is further disclosed that size of buckets are generated with large size of buckets first then the small buckets are merged into larger ones. Since the task table is generated from the initial set of tables and the larger buckets are first

generated this shows that the resulting task table will represent a queue of task where the larger size of buckets are first. Therefore in section 2.2 and 3.2 where the processors are acquiring task the processors will be selecting the task with the larger size of buckets which meets the limitation as claimed.

- **and said plurality of entities operating in parallel on work partitions assigned to them to perform said operation,** it should be understood that the processor disclosed above by **Hongjun** are operating in parallel (Abstract).
- **wherein assigning the work partitions in a sequence includes assigning a first previously unassigned work partition to a particular entity of the plurality of entities, and when the particular entity completes processing the first work partition**, as (sec. 2.2) "if there are tacks available in the system, the processor will be assigned the next task for execution" by stating next task, Hongjun inherently teaches that a previous task has been assigned and completed.
- **picking a second previously unassigned work partition based at least in part to the size of the second work partition, and assigning the second unassigned work partition to the particular entity for processing**, as (sec. 2.2) clearly discloses the processor will be assigned the next task for execution where the tasks are from the system task pool. It should be understood that "the next task" means that the previous selected task is completed and a second task is being chosen for processing and since the tasks are being chosen from the system task pool, these task has not been previously assigned to a particular processor. Also as shown above the tasks are being selected from the task table

that is generated with the larger buckets at the top of the list therefore the task are being selected according to size of buckets which corresponds to the task.

As per Claim 28, Claim 27 is incorporated and further Hongjun discloses:

- **wherein the step of assigning the work partitions in a sequence is performed by assigning relatively larger work partitions before assigning relatively smaller work partitions**, as in Sec. 3.1, Hongjun discloses the process of generating tasks and discloses that the number of buckets determines the number of tasks which is represented by B, and the task table is generated from initial set of tables which represents the tasks and corresponding size of buckets. It is further disclosed that size of buckets are generated with large size of buckets first then the small buckets are merged into larger ones. Since the task table is generated from the initial set of tables and the larger buckets are first generated this shows that the resulting task table will represent a queue of task where the larger size of buckets are first. Therefore in section 2.2 and 3.2 where the processors are acquiring task the processors will be selecting the task with the larger size of buckets which meets the limitation as claimed.

Claim 63 and 64 are a computer-readable medium claims corresponding to the method claims 27 and 28 respectively and are rejected under the same reason set forth in connection to rejections of claims 27 and 28 respectively above. Where **Hongjun** further teaches **a computer-readable medium** as (sec. 2) "shared disk" is the multiprocessor system.

11. Claims 38 and 74 is rejected under 35 U.S.C. 102(e) as being anticipated by **Osana (US 5442569 A).**

As per claim 38, Osana discloses:

- **receiving a statement that specifies at least an operation; determining a user-specified degree of parallelism to use in performing the operation; dividing the operation into a set of work partitions; performing a determination of how many entities to use to perform said operation based, at least in part, on the user-specified degree of parallelism,** at least by (col. 16 lines 55-56) "number of linear equations in each subsystem will be defined by user requirements, such as the number of linear equations, processing time constraints, and other hardware constraints"…(col. 18 lines 19-22) "the parallel processing approaches of Fig. 13a-13c can be combined to achieve the best operating performance for a given set of user requirements", where the user requirements are the statement related to the user specified degree of parallelism, and the number of linear equations defined by the user requirement and the parallel processing approaches is the performing a determination of how many entities to use to perform the operation as claimed.
- **assigning work partitions from said set of work partitions to a plurality of entities based on said determination; and said plurality of entities operating in parallel on work partitions assigned to them to perform said operation**, at least by (col. 19 lines 4-9) "the number of parallel processing stages is determined by the operating performance and specifications determined by the user. The parallel processing approaches of FIGS. 15a and 15b can be combined to achieve operation performances that best suit user requirements", where the processing stages and parallel processing approaches are the assignments of linear equations to each subsystem therefor are assigning work partitions to plurality of entities based on the user requirements.

Claim 74 is a computer-readable medium corresponding to the method claim 38 and is rejected under the same reason set forth in connection to rejections of claim 38 respectively above. Where **Osana** further teaches **a computer-readable medium** as (col. 16 lines 15-21) "memory 130".

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. Claims 42 and 78 rejected under 35 U.S.C. 103(a) as being unpatentable over **Hongjun in view of Matsumoto (US 5448732 A).**

As per claim 42, Hongjun discloses:

- **dividing an operation required by said query into a set of work partitions by generating a set of query fragments**, as (sec. 2.1) where a query is decomposed into an optimal amount of tasks, where the query is the operation and the tasks are work partitions.

But fails to disclose: **incorporating hints into at least some of said query fragments, wherein the hint associated with a given query fragment indicates how to perform the work partition associated with said given query fragment; assigning query fragments from said set of query fragments to a plurality of entities; and said plurality of entities operating in parallel on query fragments assigned to them to perform said operation, wherein entities**

working on a query fragment associated with a hint perform the work partition associated with said query fragment in a manner dictated by said hint.

However, **Matsumoto** teaches the above limitations as (col. 11 lines 56-col. 12 lines 20) "Registers and flags common in a group can be written simultaneously through a shared bus. That is, the scheduler can output, on the shared bus, a command with a designated group. This command modifies registers in the controllers in the designated group. Likewise, the scheduler can modify registers in any processor other than one connected to the scheduler...." where the flags are hints that are sent along with the a designated group where the group are fragments or tasks to be assigned to the processor.

Therefore it would have been obvious to one of the ordinary skill in the art at the time of the invention made to incorporate the teaching of **Matsumoto** into the teaching of **Hongjun** because one of the ordinary skill in the art would have been motivated to use such a modification for the purpose of having the ability to modify how multiple task are handle and assigned to multiple processors to sure proper synchronization and achieve higher productivity form the parallel processing.

Claim 78 is a computer-readable medium corresponding to the method claim 42 and is rejected under the same reason set forth in connection to rejections of claim 42 respectively above. Where **Hongjun** further teaches **a computer-readable medium** as (sec. 2) "shared disk" is the multiprocessor system.

Conclusion

14. The prior art made or recorded and not relied upon is considered pertinent to applicant's disclosure.

TITLE: Scheduling for multi-task manufacturing equipment US 5402350 A.

TITLE: Programmable controller with multiple task processors, US 4937777 A

TITLE: Programmable controller with multiple priority level task processing, US 5193189 A

TITLE: Methods for efficient distribution of parallel tasks to slave processes in a multiprocessing system, US 5257372 A

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DENNIS TRUONG whose telephone number is (571)270-3157. The examiner can normally be reached on MON - FRI: 7:30 - 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mahmoudi Tony can be reached on (571) 272-4078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tony Mahmoudi/
Supervisory Patent Examiner, Art Unit 2169

/Dennis Truong/

Examiner, Art Unit 2169